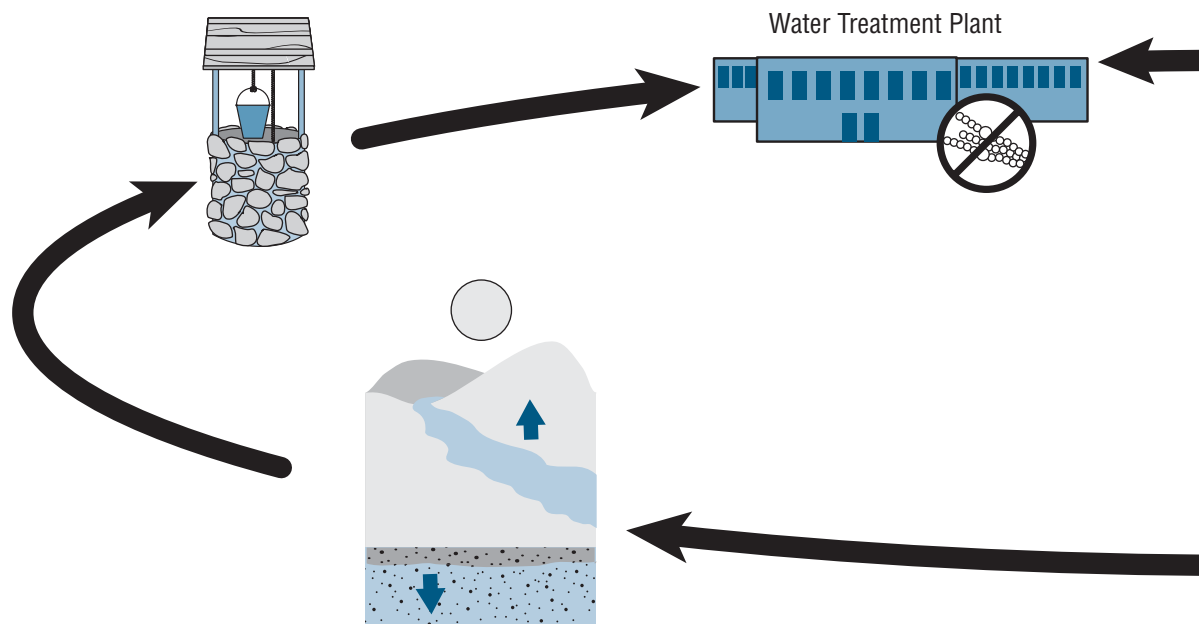




Household Water



Where Does it Come From?...Where Does it Go?

Learning Objectives: Students will: (1) summarize and illustrate how a water treatment plant and wastewater treatment plant work, (2) describe the source of water for their community and the adequacy of groundwater to meet the community's needs and (3) explain where the wastewater goes after it has been treated.

Subjects: Environmental Education, Science, Health Education and Social Studies

WMASs: EE: A.8.1, B.8.22

SC: C.8.1, G.8.1

HE: D.8.2

SS: D.8.4, E.8.5

Grades: 6–9

Materials:

- ❖ pencils and paper

Background: Have you ever wondered where the water comes from when you turn on your tap or where it goes after it drains from your bathtub? Water for most urban and suburban areas in Wisconsin comes from city or town wells that tap an underlying aquifer. *Groundwater* from these wells passes through a water treatment facility on the way to our homes and through a wastewater treatment facil-

ity after draining from our sinks, bathtubs and toilets.

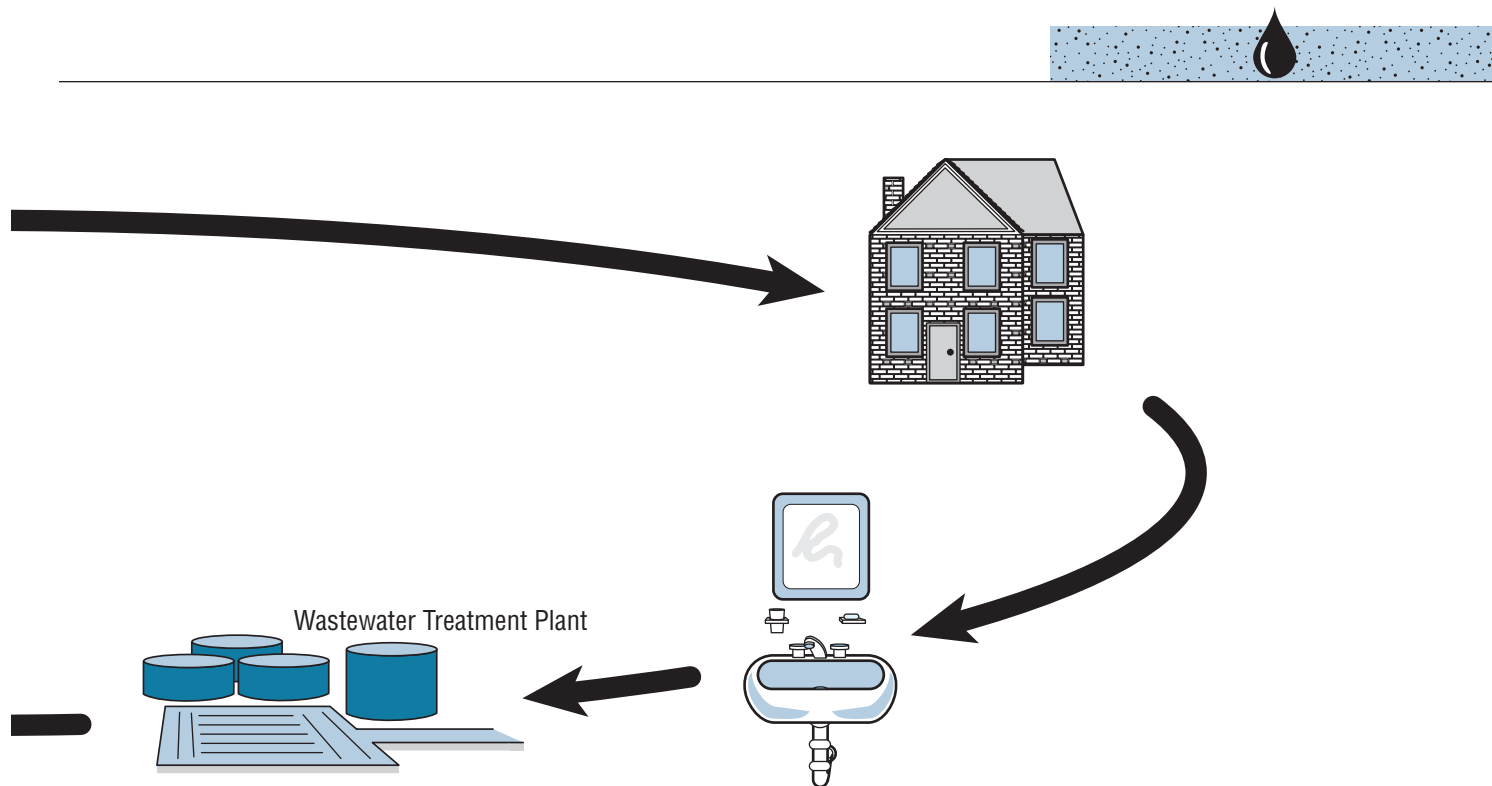
The following field trips (or guest speakers) can help students understand the workings of these facilities and encourage them to think about where their water comes from, how it is changed as it passes through their homes and how it must be treated before it is allowed to return to the groundwater supply.

Procedure:

A) Investigate a water treatment facility.

1. Contact your municipal water treatment facility and obtain permission to visit it. Arrange with the manager or other resource person to guide your trip and be available to answer questions. If a field trip is not possible, arrange for a water treatment specialist to speak to your class.
2. Before visiting the water treatment plant or having a guest speaker, develop a list of questions you would like answered. Send the list to the guide or guest speaker in advance so he/she can prepare responses. Questions to consider include:

- ❖ From what aquifer(s) does your school or municipality get its water?
- ❖ What is the extent (area), boundaries and depth of the aquifer?
- ❖ What geological materials make up the aquifer?
- ❖ How many wells does your school or community use? Where are they? How deep are they? How much water can they pump per minute/hour/day? When were they installed?
- ❖ What is a “cone of depression?” What is the extent of the cone of depression surrounding the well(s)? How does the cone of depression affect groundwater movement in the area?
- ❖ What time of the day, year, does the system pump the most water? Why?
- ❖ What is the natural chemical composition of the water before it is treated? How does the natural chemical composition compare with other wells around the state?



- ❖ How is water transported from the treatment plant to homes and businesses?
- ❖ Does the municipality have an adequate water supply for future needs?
- ❖ Are there any present or potential sources of contamination to the well(s)?
- ❖ What does the treatment plant do to ensure that the water is safe to drink? What treatment methods are used?
- ❖ Is your community planning to drill new wells in the near future? If so, how much will it cost? Who will pay?
- ❖ How are local households charged for the water they use? (Do all local homes have water meters?)
- ❖ Does the price per gallon of water increase, decrease or stay the same as the amount used goes up? Does this pricing system encourage conservation?
- ❖ Does your community encourage water conservation in any other way?

3. Ask students to draw a diagram of a water treatment plan (including wells and aquifers) and describe how the facility works.

B) Investigate a wastewater treatment facility.

1. Arrange a field trip or guest speaker as outlined in part A.

2. Prepare and send a list of questions you would like answered to the field trip guide or guest speaker so he/she can prepare responses. Questions to consider include:

- ❖ What household water passes through a wastewater treatment plant?
- ❖ Are all the homes in the community connected to a wastewater treatment facility?
- ❖ How does a wastewater treatment facility work?
- ❖ What is “graywater?”
- ❖ What is “sludge?” Is it solid or hazardous waste? Why?
- ❖ What is done with sludge from the treatment plant?
- ❖ How much wastewater is processed each day?

- ❖ What training does the operator have?
 - ❖ What happened to wastewater before the treatment plant was built?
 - ❖ How might wastewater affect groundwater?
 - ❖ What household materials should not be washed down the drain? Why?
 - ❖ Can household chemicals affect bacteria at the wastewater treatment facility?
 - ❖ How might sludge affect groundwater?
 - ❖ What is the difference between a septic system and a wastewater treatment plant?
 - ❖ How might a septic system affect groundwater?
- 3.** Ask students to draw a diagram of a wastewater treatment plant and describe how the facility works.

Adapted from: *Groundwater Study Guide*, 1984, Wisconsin Department of Natural Resources, Bureau of Information and Education (out of print).